



A.D. 1870, *3rd MARCH.* N° 630.

S P E C I F I C A T I O N .

OF

JAMES CONYERS MORRELL.

TREATING SEWAGE.

L O N D O N :

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY :

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,

25, SOUTHAMPTON BUILDINGS, HOLBORN.

Price 10d.

1870.



A.D. 1870, 3rd MARCH. N° 630.

Treating Sewage.

LETTERS PATENT to James Conyers Morrell, of Leyland, in the County of Lancaster, for the Invention of “**IMPROVEMENTS IN APPARATUS APPLICABLE TO THE TREATMENT OF TOWNS’ AND DOMESTIC REFUSE FOR SANITARY PURPOSES.**”

Sealed the 20th May 1870, and dated the 3rd March 1870.

PROVISIONAL SPECIFICATION left by the said James Conyers Morrell at the Office of the Commissioners of Patents, with his Petition, on the 3rd March 1870.

I, JAMES CONYERS MORRELL, of Leyland, in the County of Lancaster, do hereby declare the nature of the said Invention for “**IMPROVEMENTS IN APPARATUS APPLICABLE TO THE TREATMENT OF TOWNS’ AND DOMESTIC REFUSE FOR SANITARY PURPOSES,**” to be as follows :—

The refuse proposed to be treated by this Invention comprises human excreta, the ashes and cinders of the domestic or other fire, sulliage, or
10 as called by some sewage. The first of these, vizt., human excreta, is

Morrell's Improvements in Apparatus for Treating Sewage.

to be collected in what is known as a "dry commode" or "closet," having by preference a movable vessel as the receptacle, attached to and forming a portion of which is a penthouse or box containing an ash screener somewhat similar to that for which Letters Patent were granted to me on the 13th March 1867, by which the cinders are sifted 5 and the ash dust conveyed into the excrement receptacle for absorbing and deodorizing the excreta.

The penthouse or box is by suitable framework joined to the commode seat, and within such penthouse or box is fixed the riddle, screen, or sieve before named at an angle from the horizon, having by 10 preference its higher edge abutting the side forming the back protection to the seat, the attachment or suspension being by preference a flat bar screwed to the screen frame with pivotted ends working in suitable journals attached to the sides of the penthouse or casing at its upper corners. This riddle, screen, or sieve receives the unscreened ashes 15 through a hole in the top of the penthouse, and is provided with sides to direct the cinders as they separate from the ash dust and descend the incline into a suitable receptacle, the ash dust passing through the riddle, screen, or sieve falling on to inclined planes attached to and forming as it were a hopper underneath such sieve with their lowest 20 edges converging towards one point. At this point a funnel or tube is attached, directed and inclining towards the excrement receptacle placed below the seat, such funnel or tube either conveying the ash dust direct into the excrement receptacle or on to a receiver or measurer made either simply of a flat board or in the form of a shoe having a flat 25 bottom with sides open at one end wholly, at the other end partially, and of such a width that the tube or funnel mouth may fit or work within it. This shoe or measurer may either be attached by hinge to the tube itself, in which case it will simply rest and work loosely on a bar below it at its lower end, or it may be hinged at its under side upon 30 such bar. In either case it will move and distribute its charge of ash dust into the excrement receptacle as herein-after described. Such receiver or measurer may, however, by being made of a greater length be carried direct from the point of conveyance of the hopper sides to the excrement receptacle and so dispense with the funnel or tube, being 35 attached to one of the inclined planes forming the hopper sides, in which case it will rest and work upon a bearer bar, or it may work loosely under hopper mouth and be hinged upon bearer bar. Across the lower

Morrell's Improvements in Apparatus for Treating Sewage.

end of the screener frame is a bar of iron projecting at each side, one of which projections or both may be connected with journal attachments by a down piece or down pieces (by preference of iron) to the end of a lever or the ends of levers. This lever or these levers have their fulcrum
5 attached to a side or the sides of the casing forming the combined ash screener, penthouse, and commode, or to a bar running across such casing at the other end rising and supporting the commode seat or descending and attached to a treadle or a footboard, or attached to a handle. By the depression of the commode seat or the treadle or the footboard or
10 by the use of the handle motion is given to the screener and its attachments, by which the cinders are carried down its incline and the ash dust on to inclined planes below, thence into the excrement receptacle direct, or into the measurer or to the receiver, which on the depression before named assumes by the consequent receding from the motion
15 given as described of the hopper mouth or of the funnel mouth into a level position or thereabouts, and on the relief from depression immediately falls into its former position and so distributes its contents of ash dust into the excrement receptacle, the mouth of the funnel in this latter case being closed by fitting itself against a cover which is attached
20 to or forms a portion of the case. It is not, however, absolutely necessary that this funnel mouth should be so closed. The height of the rise or fall of the levers may be adjusted by a rigid or elastic suspension attached to the sides of the penthouse or of falling upon receiving plates below them, which, by preference, shall have attached
25 to them pieces of elastic materials. The hole in the penthouse is fitted with a lid which is suspended near its centre by suitable hinges, when closed one portion filling the aperture, the other portion falling underneath the immovable portion of the penthouse cover, when open the former rising and the latter forming a barrier to the too rapid descent
30 of the ashes thrown upon the screener. By the fixing on the inner side or sides of the pieces placed to direct the cinders pieces of wood or of other material of an angular or other suitable shape the lower end of the lid is so forced as to cause it to close when motion is given to the screener. In this way my Invention effects such improvements as
35 to combine a commode, a cinder sifter, an ash deliverer, or ash measure or deliverer as it were all in one portable piece, suitable either for dwelling houses, offices, or other premises requiring only a floor to stand upon, with walls and roof to secure its privacy as a closet, such walls or inclosures having, however, openings through which to put in the

Morrell's Improvements in Apparatus for Treating Sewage.

unscreened ashes and to draw out the receptacles for excrement with ash dust and that for cinders which may be fixed on wheels or otherwise as is most suitable. The screw or seive may be supplemented by an additional one of finer mesh placed at a similar angle or thereabouts and underneath it, the object of this being to reduce the ash conveyed 5 to the excrement receptacle to the finest powder. The sulliage, or as called by some sewage, now remains to be treated; by this I mean the house slops, chamber liquid (urine), culenary water, and such like, the object I aim at in the treatment of these matters being the purification or comparative purification thereof before they are allowed to enter the 10 sewer. To do this I propose to convert the cinder box embraced in the apparatus already described into a filterer by placing within it but at a distance from its bottom a perforated plate upon which the cinders are received, and on to which the liquid is conveyed by a tube with suitable mouth attachment being appended to the casing of the apparatus 15 already described. The mouth at the outside after passing through the cinders and the perforated plate the purified liquid will pass from the lower side through an opening into a drain or into the sewer. This mode of cleansing the liquid named cannot be claimed by me as unknown to the public, having myself published the suggesting in the Building 20 News of January 1869, and having permitted it to appear with the Drawing, a paper read by Doctor Lyson to the Manchester and Salford Sanitary Association, and more recently worked out by Mr. Whiley, of Manchester. I describe it however as affording evidence of the increased public utility of the apparatus already described though not necessarily 25 forming a portion of such apparatus.

By another modification I cleanse such liquid by the introduction of foreign matter, in which case the cinders are left for reburning on the premises. To carry out this modification I provide a strong box or tank of wood, iron, or other suitable material. Within this box I 30 fix at its side or end near the top a smaller box either square or internally formed as a hopper. This latter box is for the reception of a purifying chemical liquid or solid at a level somewhat below its bottom. I make in the larger box an overflow hole by which passes away the purified liquid. Having assumed that a given quantity of impure liquid 35 will require a given quantity of precipitating or purifying liquid or solid chemical, I then place underneath the aperture to the larger box (the remainder being covered over) what I call a tipping vessel, that

Morrell's Improvements in Apparatus for Treating Sewage.

is, a vessel made in the form of a globular ale glass. This vessel is fixed at its stem on an axle running from extreme side to side of the larger box. One end passes through the lower part of the chemical receptacle and having one of its working journals on the side of such a receptacle, 5 the other working journal being on the opposite side of the larger vessel, the foot of the tippler being weighted. It will be understood that its mouth will stand open underneath an aperture, through which the liquids are conveyed in their discharge from the house, and so become charged with such liquid by a proper adjustment of the weight before 10 named. This tippler will immediately upset and discharge its contents into the larger vessel, and in doing so will give a turn to the axle on which it is fixed; attached to this axle at the point where it enters the chemical box is a valve which opens by the motion of the axle before given. By the adjustment of the hole closed by the valve 15 a given quantity of purifying material escapes into the larger vessel, then to perform its office of precipitating and purifying the liquid therein contained. On the axle within the chemical box is placed a brush to agitate and keep in an equally liquified state the liquid compound of the chemical box, or if a solid is used a propeller, which on the turn of 20 the axle will force a given quantity of it through the opening hole into the larger tank or box. This box or tank I place by preference alongside and between the cinder receptacle and excrement receptacle of the apparatus already described conducting the liquid into it by the mouth and tube described as applicable in case the cinders are used as purifiers. 25 It may then be drawn out and emptied simultaneously with those from the passage outside the yard. It may, however, be placed in any more suitable situation, either below the surface of the yard or upon the surface. The purified liquid passing from its overflow mouth will pass either by a fall or by means of a moveable connection into the drain 30 or sewer. In lieu of the tippler of the vessel a flat plate forming a lever weighted on one side may be used, so adjusted on the axle as to operate the discharge of chemical (liquid or solid) by receiving its pressure from the weight of liquid falling upon it, but I prefer the measuring tippler.

Morrell's Improvements in Apparatus for Treating Sewage.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said James Conyers Morrell in the Great Seal Patent Office on the 3rd September 1870.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JAMES CONYERS MORRELL, of Leyland, in the County of Lancaster, send 5
greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Third day of March, in the year of our Lord One thousand eight hundred and seventy, in the thirty-third year of Her reign, did, for Herself, Her heirs and successors, give and 10
grant unto me, the said James Conyers Morrell, Her special licence that I, the said James Conyers Morrell, my executors, administrators, and assigns, or such others as I, the said James Conyers Morrell, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter 15
during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for
“**IMPROVEMENTS IN APPARATUS APPLICABLE TO THE TREATMENT OF TOWNS’ AND DOMESTIC REFUSE FOR SANITARY PURPOSES,**” upon the condition (amongst 20
others) that I, the said James Conyers Morrell, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal 25
Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said James Conyers Morrell, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and 30
by the following statement :—

The refuse proposed to be treated by this Invention comprises human excreta, the ashes and cinders of the domestic or other fire, sulliage, or as called by some sewage. The first of these, namely, human excreta, is to be collected in what is known as a “dry commode” or closet, 35
having by preference a moveable vessel as receptacle, attached to and

Morrell's Improvements in Apparatus for Treating Sewage.

forming a portion of which is a penthouse or box or chamber containing an ash screener (somewhat similar to that for which Letters Patent were granted to me on the 13th day of March 1867), by which the cinders are sifted, and the ash dust conveyed into the excrement receptacle
5 for absorbing and deoderizing the excreta.

The penthouse or box or chamber is by suitable framework joined to the commode seat, and within such penthouse or box or chamber is fitted the riddle, screen, or sieve before named at an angle from the horizon, having its higher edge abutting, one of the sides forming the penthouse,
10 box, or chamber, the attachment or suspension being by preference a flat bar screwed to the screen frame with pivoted ends working in suitable journals attached to other sides of the penthouse or casing at or near its upper corners. This riddle, screen, or sieve receives the unscreened ashes through a hole in the top of the penthouse, or in any
15 other suitable manner, and is provided with sides to direct the cinders as they separate from the ash dust, and descend the incline into a moveable receptacle, the ash dust passing through the riddle screen or sieve falling on to inclined planes attached to and forming as it were a hopper underneath such sieve with their lowest edges converging towards one
20 point. At this point a funnel or tube is attached directed and inclining towards the excrement receptacle placed below the seat, such funnel or tube either conveying the ash dust direct into the excrement receptacle or on to a receiver or measurer made either simply of a flat board or in the form of a shoe, having a flat bottom with sides open at one end
25 wholly, at the higher end partially, and of such a width that the tube or funnel mouth may fit or work within it. This shoe or measurer may either be attached by hinge to the tube itself, in which case it will simply rest and work loosely on a bar below it at its lower end, or it may be hinged at its under side upon such bar. In either case it will move and
30 distribute its charge of ash dust into the excrement receptacle, as hereinafter described. Such receiver or measurer may however by being made of a greater length be carried direct from the point of convergence of the hopper sides to the excrement receptacle, and so dispense with the funnel or tube, being attached to one of the inclined planes forming the
35 hopper sides, in which case it will rest and work upon a bar, or it may work loosely and be hinged upon a bearer bar. Across the lower end of the screener frame is a bar of iron projecting at each side, one of which projections or both may be connected with journal attachments by a

Morrell's Improvements in Apparatus for Treating Sewage.

down piece or down pieces (by preference of iron) to the end of a lever or ends of levers. This lever or these levers have their fulcrum attached to a side or the sides of the casing forming the combined ash screener, penthouse, and commode, or to a bar running across such casing, at the other end rising and supporting the commode seat or descending and attached to a treadle or foot board, or attached to a handle. By the depression of the commode seat or the treadle, or the foot board, or by the use of the handle motion is given to the screener and its attachments, by which the cinders are carried down its incline, and the ash dust on to the inclined planes below them into the excrement receptacle direct, or 10 into the measurer or on to the receiver, which on the depression before named assumes by the consequent receding from the motion given as described by the hopper mouth or of the funnel mouth a level position or thereabouts, and on the relief from depression immediately falls into its former position and so distributes its contents of ash dust into the 15 excrement receptacle, the mouth of the funnel in this latter case being closed by fitting itself against a cover which is attached to or forms a portion of the case. It is not however absolutely necessary that this funnel mouth should be so closed. The height of the rise or fall of the levers may be adjusted by a rigid or elastic suspension attached to the 20 sides of the penthouse or by falling upon receiving plates below them, which by preference shall have attached to them pieces of elastic material. The hole in the penthouse is fitted with a lid which is suspended near its centre by suitable hinges, when closed one portion filling the aperture, the other portion falling underneath the im- 25 moveable portion of the penthouse cover, when open the former rising and the latter forming a barrier to the too rapid descent of the ashes thrown upon the screener. By the fixing on the inner side or sides of the pieces placed to direct the cinders pieces of wood or of other material of an angular or other suitable shape, the lower end of the lid 30 is so forced as to cause it to close when motion is given to the screener. In this way my Invention effects such improvements as to combine a commode, a cinder sifter, and ash deliverer, or ash measurer and deliverer as it were all in one portable piece, suitable either for dwelling houses, offices, or other premises requiring only a floor to stand upon, 35 with walls and a roof to secure its privacy as a closet, such walls or enclosures having however openings through which to put in the unscreened ashes and to draw out the receptacles for excrement with ash dust and that for cinders, which may be fixed on wheels or otherwise as

Morrell's Improvements in Apparatus for Treating Sewage.

is most suitable. The screen or sieve may be supplemented by an additional one of finer mesh placed at a similar angle or thereabouts and underneath it, the object of this being to reduce the ash conveyed to the excrement receptacle to the finest powder. The sulliage, or as called by
5 some sewage, now remains to be treated ; by this I mean the house slops, chamber liquid (urine), culinary water, and such like, the object I aim at in the treatment of these matters being the purification thereof before they are allowed to enter the sewer. To do this I propose to convert the cinder box embraced in the apparatus already described into
10 a filterer by placing within it but at a distance from its bottom a perforated plate upon which the cinders are received, and on to which the liquid is conveyed by a tube with a suitable mouth attachment being appended to the casing of the apparatus already described, the mouth at the outside after passing through the cinders and the perforated plate
15 the purified liquid will pass from the lower side of the box through an opening into a drain or into the sewer. This mode of cleansing the liquid named cannot be claimed by me as unknown to the public, having myself published the suggestion in the "Building News" of January 1869, and having permitted it to appear with a Drawing in a
20 paper read by Dr. Syson, to the Manchester and Salford Sanitary Association, and moreover recently worked out by Mr. Whitley of Manchester. I describe it however as affording evidence of an increased public utility of the apparatus already described, though not necessarily forming a portion of such apparatus.

25 By another modification I cleanse such liquid by the introduction of foreign matter, in which case the cinders are left for reburning on the premises. To carry out this modification I provide a strong box or tank of wood, iron, or other suitable material. Within this box I fix at its side or end near the top a smaller box, either square or internally formed
30 as a hopper. This latter box is for the reception of a purifying chemical (liquid or solid) at a level somewhat below its bottom. I make in the larger box an overflow hole which passes away the purified liquid. Having assumed that a given quantity of impure liquid will require a given quantity of precipitating or purifying liquid or or solid chemical, I
35 then place underneath the aperture to the larger box (the remainder being covered over) what I call a tipping vessel, that is, a vessel made in the form of a globular ale glass. This vessel is fixed at its stem on an axle running from extreme side to side of the larger box, one end passing

Morrell's Improvements in Apparatus for Treating Sewage.

through the lower part of the chemical receptacle, and having one of its working journals on the side of such receptacle, the other working journal being on the opposite side of the larger vessel. The foot of this tippler being weighted it will be understood that its mouth will stand open underneath an aperture through which the liquids are conveyed 5 on their discharge from the house, and so become charged with such liquid; by a proper adjustment of the weight before named this tippler will immediately upset and discharge its contents into the larger vessel, and in doing so will give a turn to the axle on which it is fixed; attached to this axle at the point where it enters the chemical box is a valve, 10 which opens by the motion of the axle before given; by the adjustment of the size of the hole caused by this valve a given quantity of purifying material escapes into the larger vessel, there to perform its office of precipitation and purifying the liquid therein contained. On the axle within the chemical box is placed a brush to agitate and keep in an 15 equally liquified state the liquid compound of the chemical box, or if a solid is used a propeller, which on the turn of the axle will force a given quantity of it through the opening hole into the larger tank or box. This box or tank I place by preference alongside and between the cinder receptacle and the excrement receptacle of the apparatus already described 20 conducting the liquid into it by the mouth and tube described as applicable in case the cinders are used as purifiers. It may then be drawn out and emptied simultaneously with those from the passage outside the yard. It may however be placed in any more suitable situation, either below the surface of the yard or upon the surface; the purified liquid 25 passing from its overflow mouth will pass either by a fall or by means of a moveable connection into the drain or sewer. In lieu of the tippler vessel a flat plate forming a lever weighted on one side may be used, so adjusted on the axle as to operate the discharge of chemical (liquid or solid) by receiving its pressure from the weight of liquid falling upon it, 30 but I prefer the measuring tippler.

The before-going being the nature and object of my Invention, I will now proceed to describe more in detail the manner in which the same is to be or may be performed or carried out into practical effect, and in order that the same may be more clearly and readily seen and understood 35 I have hereunto annexed a Sheet of Drawings illustrative thereof, and have marked them with figures and letters of reference corresponding with those in the following explanation. Like letters and figures marked

Morrell's Improvements in Apparatus for Treating Sewage.

thereon are used to denote similar parts throughout the various Figures.

Figure 1 is an outside perspective elevation of my self-contained dry ash closet; Figure 2 is a sectional elevation of same showing screener, 5 excrement, and cinder receptacles together with mode of agitating screener and ash measurer by depression of the seat.

Figure 3 is a sectional elevation illustrating my self-contained closet having screener hung from the side of penthouse; Figure 4 is a plan of same; Figure 5 is a section through *a*, *b*, Figure 4.

10 Figure 6 is a sectional elevation illustrating my self-contained closet and having the screener agitated by depression of a foot board also having three receptacles, one for excrement and ash dust, one for cinders for reburning, and another for smaller cinders and acting as a filterer for liquid matter.

15 Figure 7 illustrates a modification of the hopper, spout, and shoe, or ash measurer.

Figures 8 and 9 illustrate modifications of the ash measurer or director.

Figures 10 and 11 illustrate forms of riddle or screener.

20 Figure 12 illustrates apparatus for cleansing or purifying liquid by the introduction of foreign matter.

Figure 13 illustrates a penthouse containing a screener suitable for use to be fixed or attached to the ordinary privies or ash-pits.

Figure 14 illustrates a screener hung from side of penthouse and 25 worked or agitated by a single lever actuated from the front of the seat of the commode.

a, penthouse, box, or chamber; *b*, commode seat; *c*, pan of commode seat; *d*, ash screener or riddle; *e*, sides and bottom of ash screener forming hopper; *f*, hinge or pivot of ash screener; *g*, shoot or funnel of 30 ash screener; *h*, shoe or measurer of ash screener; *i*, bar running across ash screener and forming rib for cinders to shake or roll over; *k*, door or lid of *l*, hole or aperture in penthouse top for placing cinders; *m*, bar running across penthouse and supporting shoe or measurer *h*; *n*, lever having its fulcrum at *o* worked by depression of commode seat *b*, and 35 agitating screen *d* by means of connecting rod *p*; *q*, excrement and ash receptacle; *r*, cinder receptacle; *s*, shoot for directing cinders into receptacle *r*; *t*, rest for ash screener; *t*¹, rest for ash screener through

Morrell's Improvements in Apparatus for Treating Sewage.

ash screener levers; *u*, suspender; *v*, handle and lever arrangement for agitating screener by hand.

The action of the apparatus is as follows:—The fire refuse, namely, cinders and ashes, are thrown upon the top of screener *d* through aperture *l* in penthouse *a*. Upon using the commode the seat *b* is 5 depressed and the screener *d* agitated or shaken by means of the levers *n*. The ash dust falls down the hopper *e* and into the funnel or shoot *g*, thence into the measurer *h*, which when the seat is depressed is in a horizontal position, the cinders falling down outside of screener *d* and into receptacle *r*. Upon the seat being relieved from its weight it rises 10 and brings the shoot or measurer *h* into an inclined position to discharge its contents of ashes upon the deposit in the excrement receiver *q*, and so on continuously.

I will now describe the modifications of the working parts of this my Invention. *v* in dotted lines, Figure 2, illustrates a lever and handle, 15 by which means the screener *d* may be worked or agitated, in this case dispensing with the depressing seat *b*, lever *n*, and attendant gear, but it is preferred to have the screener suspended by *u*, shown in dotted lines, or resting on a buffer *t*. The screener may be suspended from the side of the penthouse, as shown in Figures 3, 4, and 5. In this case the 20 screener may be agitated by the means of a crank lever worked by a single lever and the depression of the seat, the measurer being also worked by the lever and depression of the seat in this wise; upon the depression of the seat the crank lever *w* is elevated and agitates the screener by working into the notch *x*; the crank lever also works 25 the shoe or measurer *h* by means of the lever *y* hinged to the measurer *h* and having its fulcrum at *y*¹. In some cases I prefer to use merely a slide or board hinged to the ash hopper, as shown in Figure 6. The screener may be agitated by the action of a footboard *Z*, as shown in Figure 6. *d*¹, Figure 6, shows a second and coarser screener placed beneath 30 screener *d* for this purpose, namely, the cinders fall from screener *d* on to screener *d*¹, the coarser cinders thence fall into receptacle *r*, and the finer ones into receptacle *r*¹. Liquid matter, such as house slops, chamber liquid (urine), can be poured or emptied into receptacle *r*¹, which receptacle having a double bottom the liquid is purified by passing 35 through cinders, and is then carried away by a suitable pipe. *g*¹, Figure 7, represents a notch or angle piece, which is attached to hopper funnel *g*, which works measurer *h*, the measurer in this case being hinged or

Morrell's Improvements in Apparatus for Treating Sewage.

suspended at h^1 and weighted at h^3 . This angle piece also serves as a ram or forcer to force out the ash dust on the deposit. h^2 , Figures 8 and 9, show shoe or measurer hinged to cross bar m . In this case they are worked by the action of the hopper funnel g , and are 5 weighted at h^3 to bring them back into the inclined position. d^2 , Figure 10, shows step or gradient which is formed in screener or riddle d , so as to give action to the cinders and more efficiently separate them from the ashes. d^3 , Figure 11, shows a bar or step fixed on to screener or riddle for the similar purpose of more efficiently separating 10 the ashes or cinders. A, Figure 12, box or tank; B, smaller box or compartment for the reception of purifying chemical (liquid or solid); C, overflow pipe; D, tipping vessel; D^1 , counterbalance; E, valve; F, brush or measurer for chemical purifier.

The action of this apparatus is as follows:—The liquid is poured into 15 vessel D, which when full tips over, empties its contents into the bottom of the tank A, at the same time a portion of chemical purifier is distributed by means of the brush F through the valve E, and falls into the liquid in the tank A.

Having now described and ascertained the nature and object of this 20 my said Invention, together with the manner in which the same is to be or may be carried out into practical effect, I wish it to be clearly understood that I do not confine myself to the several proportions and relative dimensions of the various parts of the construction, as it will be readily seen that the same may be considerably varied without 25 departing from my Invention; but what I claim is,—

Firstly. The procuring of a self-contained portable combined commode and agitating ash screener, measurer, and distributor, by which the cinders are sifted for reburning, and the ash dust conducted and distributed over the deposit in the excrement receptacle, substantially in 30 the manner and for the purposes herein-before described, set forth, and illustrated.

Secondly. The procuring of a self-contained combined commode and agitating ash screener, with which the cinders are sifted and the ash dust conducted on to the deposit in the excrement receptacle, the cinders 35 being riddled, the coarser ones into a receptacle for reburning, and the finer ones into a receptacle for filtering liquid matter, substantially in the manner and for the purposes herein-before described and set forth.

Morrell's Improvements in Apparatus for Treating Sewage.

Thirdly. The mode or modes herein-before described of agitating a screener and ash measurer suspended at the side or rear end of a commode or closet, thereby separating cinders and ash dust, substantially in the manner and for the purposes herein-before described and set forth.

And, lastly. The purifying of sulliage by means of the tank shown at 5 Figure 12, with chemical box or vessel within it, substantially in the manner and for the purposes herein-before described, set forth, and illustrated.

In witness whereof, I, the said James Conyers Morrell, have hereunto set my hand and seal, this First day of September, in the 10 year of our Lord One thousand eight hundred and seventy.

JAMES CONYERS (L.S.) MORRELL.

Witness,

FREDERICK J. CHEESBROUGH,
of 43, Castle Street,
Liverpool.

15

LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1870.

FIGURE. 1.

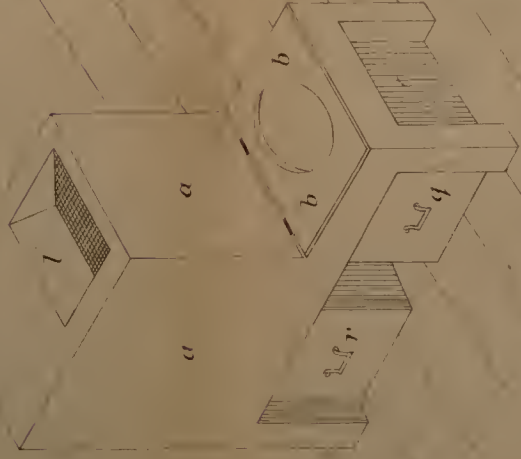


FIGURE. 2.

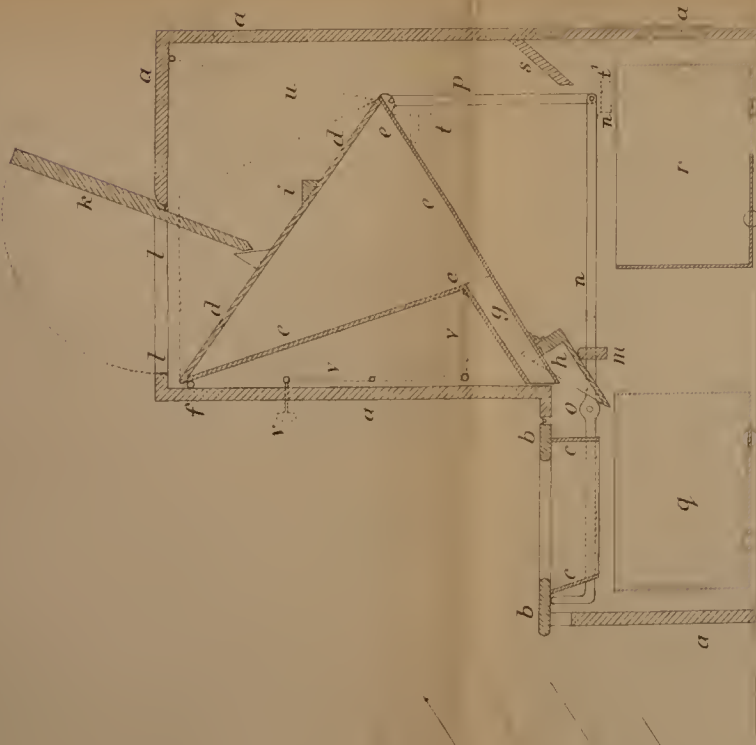


FIGURE. 3.

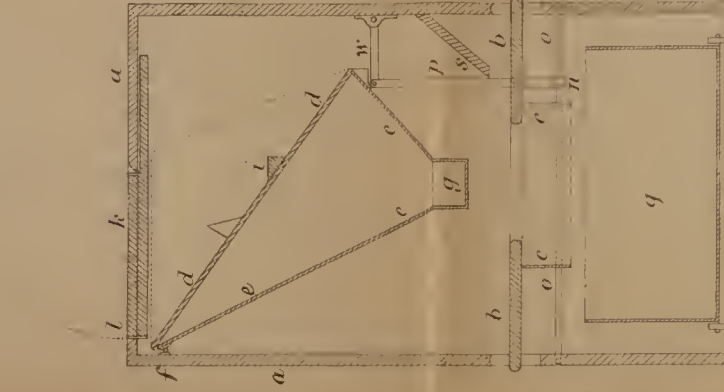


FIGURE. 6.

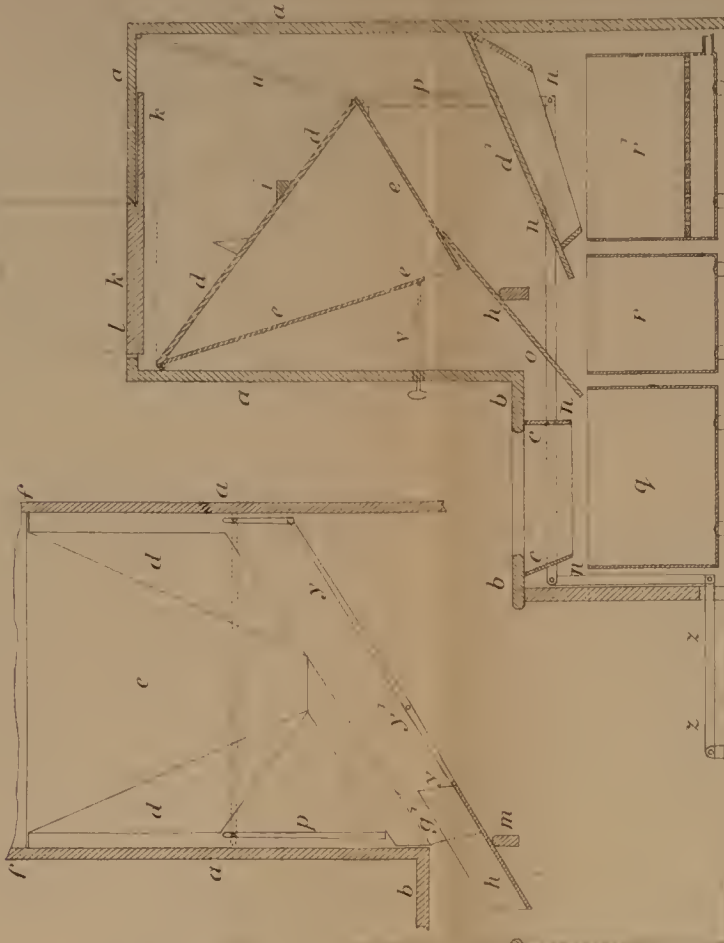


FIGURE. 5.

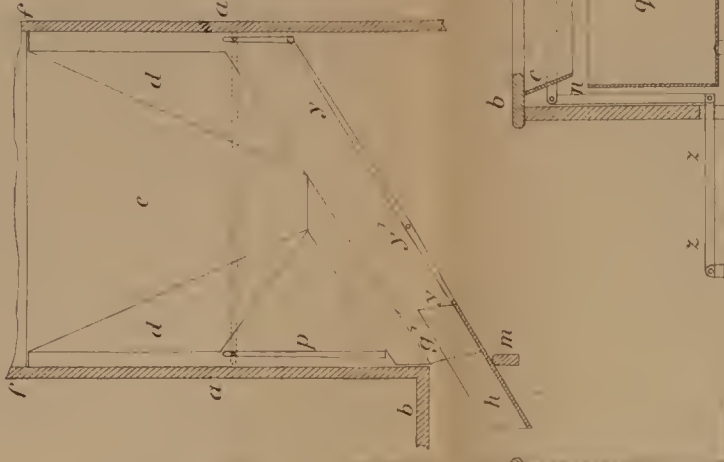


FIGURE. 4.

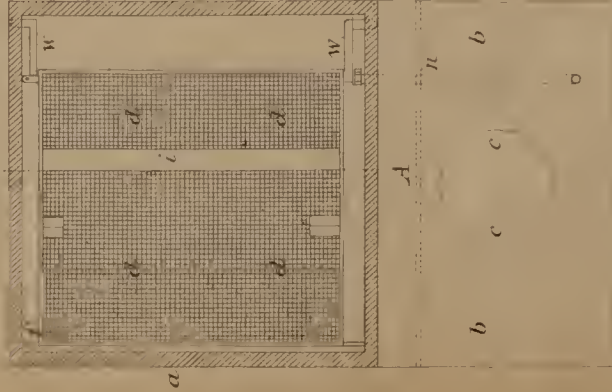


FIGURE. 13.

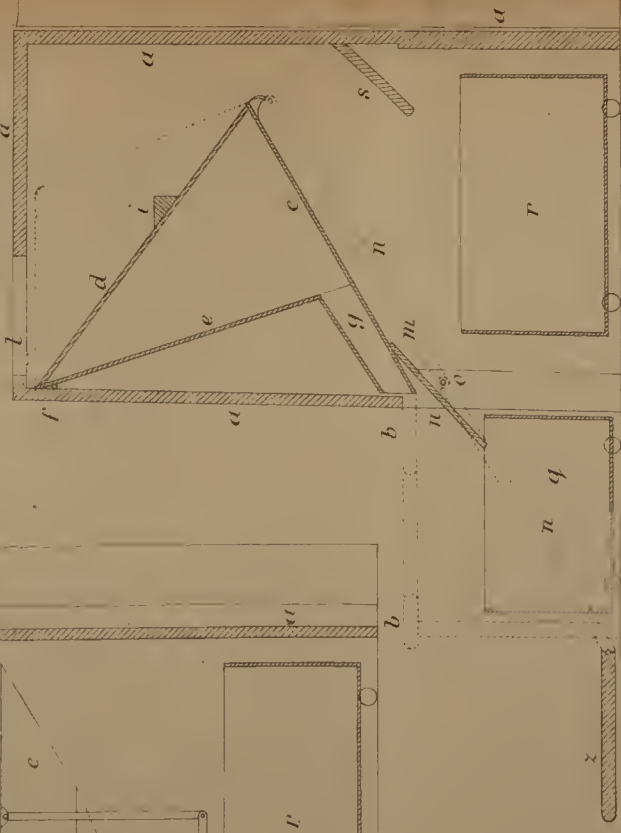


FIGURE. 14.

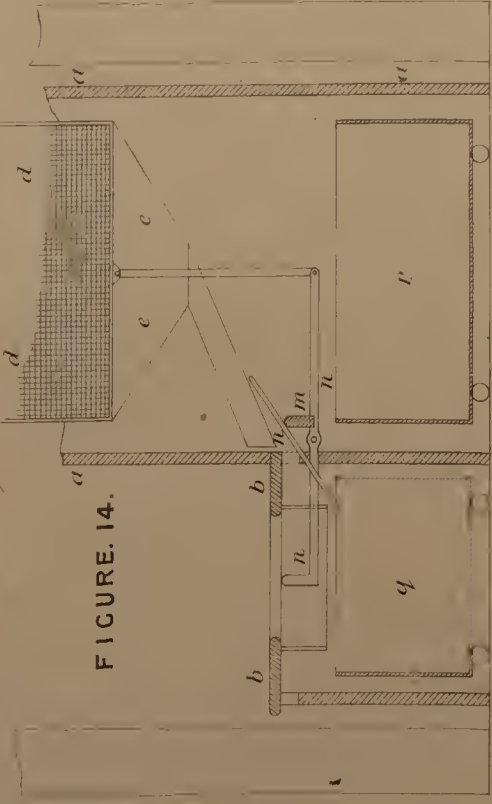


FIGURE. 7.

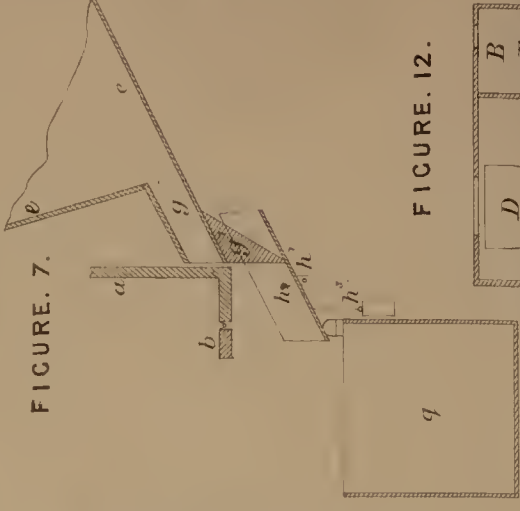


FIGURE. 8.

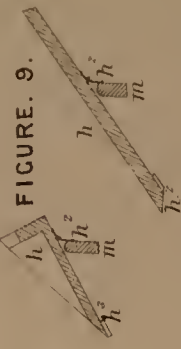


FIGURE. 9.

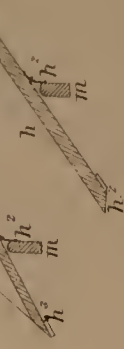


FIGURE. 10.



FIGURE. 11.



FIGURE. 12.

